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PEDAGOGICAL LAW.

ARTICLE VII.

The Law as to Religion in Schools.—Concluded.

SEC. 1. MARYLAND.—It is the duty of every man to worship God in such manner as he thinks most acceptable to Him, and all persons are equally entitled to protection in their religious liberty; wherefore, no person ought by any law to be molested in his person or estate on account of his religious persuasion or profession, or for his religious practice, unless under color of religion any man shall disturb the good order, peace, or safety of the State, or shall infringe the laws of morality, or injure others in their natural, civil, or religious rights (*Const. of Md.*, B. of R., art. 33). No other test or qualification ought to be required on admission to any office of trust or profit, than such oath of office as may be prescribed by this constitution or by the laws of the State, and a declaration of *belief in the Christian religion;* and if the party shall profess to be a Jew, the declaration shall be of his *belief in a future state of rewards and punishments* (*Id.*, art. 34). In order to carry out faithfully the spirit of these constitutional provisions, every teacher in Maryland should be a believer in the Christian religion, or, at least, in a future state of rewards and punishments. Persons who do not so believe, should not be licensed, or if any are already licensed, their licenses should be revoked. The examiners in this State may very properly inquire whether the candidates for licenses believe in the Christian religion or in a future state of rewards and punishments—for such an inquiry is a part of their legitimate duty at the examination. But they have no right to go further than the law requires. If, for example, an applicant for a certificate declares that he believes in "a future state of rewards and punishments," or "in the Christian religion," then he can be questioned no further on the subject; or if questioned, he may refuse to answer. If he says he believes in a future state of rewards and punishments, the law can require nothing more, for the Constitution prohibits any further test. It is a little singular that this Constitution, which does not secure full religious liberty, is the only one of thirty-five now before us which has the phrase "religious liberty" in it.

The Constitutions of several of the States, without the phrase, have more of the spirit.

Sec. 2. Virginia.—Religion, or the duty which we owe to our Creator, and the manner of discharging it, can be directed only by reason and conviction, not by force or violence; and it is the mutual duty of all to practice Christian forbearance, love, and charity towards each other (*Const. of Va.*, B. of R., sec. 16). There is no public-school system yet established in Virginia. At the last session of the Legislature, two of the counties, King George and Stafford, were authorized to borrow money for educational purposes, but owing to the great scarcity of money, nothing of moment has been accomplished. We have the assurance of a high official of the State, that the people are only waiting for better times in order to inaugurate a system of public schools similar to those now so successful elsewhere. If such schools are established under the present Constitution, they should, and doubtless will, be perfectly free from sectarianism.

Sec. 3. North Carolina.—All persons shall be at liberty to exercise their own mode of worship; provided that nothing herein contained shall be construed to exempt preachers of treasonable or seditious discourses from legal trial or punishment (*Const. of N. C.*, art. 34). No person who shall deny the being of God, or the truth of the Christian religion, or the divine authority of the Old or New Testament, shall be capable of holding any office or place of trust or profit, in the civil department within this State (*Id.*, art. 4, sec. 2, of Amend.) Although there is an established Church in England, the Jews were admitted to Parliament more than ten years ago. North Carolina is, in this respect, evidently behind the times. No other Southern State is so illiberal. More than two centuries ago, little Rhode Island was inspired with a new theory of government. All the other States of this Union have since caught the inspiration, either wholly or partially, but North Carolina is the most laggard of them all.

Sec. 4. South Carolina.—The free exercise and enjoyment of religious profession and worship, without discrimination or preference, shall forever hereafter (1790) be allowed within this State to all mankind, provided that the liberty of conscience thereby declared shall not be so construed as to excuse acts of licentiousness, or justify practices inconsistent with the peace or safety of this State (*Const. of S. C.*, art 8). What this State now needs more than any thing else, we imagine, is a popular system of public schools; and we have reason to believe that something of this kind is in contemplation. The legislation of this State, running through a period of more than forty years, embraces little else, in reference to schools, than the appropriations annually made to support indigent scholars. The appropriation for some twelve years was seventy-five thousand dollars annually, and previous thereto thirty-seven thousand

five hundred. This sum was appropriated to the districts according to the representation in the lower branch of the Legislature, and its expenditure was confided to Boards of Commissioners in each district. Each Board adopted its own rules and system, and hence there has been no uniformity in the organization of schools or in expending the funds. The Boards are only required to report annually to the Legislature, and exhibit the manner in which the funds have been expended and the number of indigent scholars taught. Persons who have the means of educating their own children are never permitted to share in the appropriation; the privilege is restricted to the indigent alone. (*Letter from Gov. James L. Orr*, May 12, 1866.)

Sec. 5. Georgia.—The constitutional provisions in reference to the liberty of conscience in this State are the same, in legal effect, as those of South Carolina, though more extended, and, if possible, more emphatic. (*Const. of Ga.*, art. 4, sec. 10).

Sec. 6. Florida.—All men have a natural and inalienable right to worship Almighty God according to the dictates of their own consciences; and no preference shall ever be given by law to any religious establishment, or mode of worship, in this State (*Const. of Fla.*, art. 1, sec. 3.)

Sec. 7. Alabama.—No person within this State shall, upon any pretence, be deprived of the inestimable privilege of worshiping God in the manner most agreeable to his own conscience; nor be compelled to attend any place of worship; nor shall any one be obliged to pay any tithes, taxes, or other rates, for the building or repairing of any place of worship, or for the maintenance of any minister or ministry (*Const. of Ala.*, art. 1, sec. 3). No human authority ought, in any case whatever, to control or interfere with the rights of conscience (*Id.*, sec. 4). No person shall be hurt, molested, or restrained in his religious profession, sentiments, or persuasion, provided he does not disturb others in their religious worship (*Id.*, sec. 5). The civil rights, privileges, and capacities of any citizen shall in no way be diminished or enlarged on account of his religious principles (*Id.*, sec. 6.) There shall be no establishment of religion by law; no preference shall ever be given by law to any religious sect, society, denomination, or mode of worship; and no religious test shall ever be required as a qualification to any office or public trust under this State (*Id.*, sec. 7). Every citizen may speak, write, and publish his sentiments, being responsible for the abuse of that privilege (*Id.*, sec. 8). We cite the foregoing sections of the Alabama Constitution in full, not because they are unique, for almost the same words are in the Constitutions of several other States; nor because they insure a larger religious liberty, for we are fully aware that perfection cannot be made more perfect by the mere force of repetitions. In Rhode Island, New York, New Jersey, Delaware, Virginia, South Carolina, Georgia, Florida, and several other States, religious liberty is as completely constitutional as in Alabama.

Though the provisions in some of the Constitutions may not be so extended, they are equally comprehensive, and the same in legal effect. The Constitution of Alabama, however, contains so many different expressions for the same thing, that we think any one who will take the trouble to read the sections cited, will never after be in error as to what is meant by "religious liberty."

SEC. 8. MISSISSIPPI.—The constitutional provisions in relation to the liberty of conscience, of speech, and of the press, are in legal effect the same in this State as in Alabama, and the language is very nearly the same (*Const. of Miss.*, art. 1, sec. 3–7).

SEC. 9. LOUISIANA.—The Constitution of this State is singularly silent on the subject of religion. The freedom of the press is secured, and every citizen may freely speak, write, and publish his sentiments on all subjects, being responsible for an abuse of this liberty (*Const. of La.*, tit. 6, art. 106). This is one of the few Southern States that have a system of public schools. These schools suffered greatly from the war, but it is to be hoped that they will not be permitted to languish long, now that peace is restored. So many considerations of vast import to the highest interests of the State, and so many influences affecting alike the moral and intellectual welfare of her citizens, are involved in this, that the encouragement of popular education would seem to be the simplest expression of public duty at this crisis. The war has, indeed, deprived most of those citizens, who formerly supported public schools, of the power of contributing to them for a period which it is not now easy to determine. But while this is true, it cannot be overlooked that, now more than ever, are the people in need of a liberal system of public education which will supply their children with those advantages which their private means will no longer enable them to afford. Upon the State, therefore, falls the responsibility of a wise and provident legislation—a legislation that shall hold the present in wardship for the future—to guard this beneficent system from complete extinction (*Rep. of Supt.*, Jan. 22, 1866).

SEC. 10. TEXAS.—The law on the subject under consideration is the same in Texas as in Alabama, though not expressed in the same words. It is also made the duty of the Legislature to pass such laws as shall be necessary to protect every religious denomination in the peaceable enjoyment of their own mode of public worship (*Const. of Texas*, art. 1, sec. 3 and 4).

SEC. 11. ARKANSAS.—The civil rights, privileges, or capacities of any citizen shall in no wise be diminished or enlarged on account of his religion (*Const. of Ark.*, art 2, sec. 4). But no person who denies the being of a God shall hold any office in the civil department of this State, nor be allowed his oath in any court (*Id.*, art. 8, sec. 3).

SEC. 12. TENNESSEE.—The law as to religion in this State is the same in legal effect, and almost the same in language, as in Maryland (*Const. of Tenn.*, art 1, sec. 3 and 4; *Id.*, art. 9, sec. 2).

Sec. 13. Kentucky.—The people of this State have reserved to themselves full religious liberty (*Const. of Ky.*, art. 13, sec. 5 and 6). We find nothing in the school laws inconsistent therewith.

Sec. 14. West Virginia.—The constitutional provisions are the same in legal effect as in Kentucky (*Const. of West Va.*, art. 2, sec. 9). But all teachers employed in the public schools of this State, shall read, or cause to be read, at least one chapter from the Bible, in a language understood by the scholars, every day at the opening of the school, and inculcate the duties of piety, morality, and respect for the laws and government of this country (*School Laws of West Va.*, 1866, sec. 29).

Sec. 15. Ohio, Michigan, Illinois, Missouri, Oregon, Minnesota, and Delaware.—What has been stated of Kentucky, will apply equally to all of these States (*Const. of Ohio*, art. 1, sec. 7; *Const. of Mich.*, art. 4, sec. 39–41; *Const. of Ill.*, art. 13, sec. 3 and 4; *Const. of Mo.*, art. 13, sec. 4 and 5; *Const. of Oregon*, art. 1, sec. 2–7; *Const. of Minn.*, art. 1, sec. 17 and 19; *Const. of Del.*, art., sec. 1 and 2).

Sec. 16. Indiana.—The constitutional provisions are the same in substance as in the foregoing States (*Const. of Ind.*, art. 1, sec. 2–7). But the Bible shall not be excluded from the public schools of the State (*Com. School Laws of Ind.*, 1865, sec. 167).

Sec. 17. Iowa.—The constitutional provisions are much like those in Alabama, and the same in legal effect (*Const. of Iowa*, art. 1, sec. 3 and 4). But the Bible shall not be excluded from any school or institution in this State, under the control of the Board, nor shall any pupil be required to read it contrary to the wishes of his parent or guardian (*School Laws of Iowa*, 1864, ch. 8, sec. 1). The spirit of this law, it seems to us, is more consistent with the Constitution of the State, than is the West Virginia or Indiana law on the same subject.

Sec. 18. Wisconsin.—The constitutional provisions are the same in legal effect here as in Alabama (*Const. of Wis.*, art. 1, sec. 18, 19). But the Constitution of this State also, in reference to district schools, provides that "no sectarian instruction shall be allowed therein (*Id.*, art. 10, sec. 3). We think, however, that this provision is unnecessary, as what it provides for would naturally follow from the other provisions.

Sec. 19. California.—The provision in the Constitution of California, on this subject, is similar to that in the Constitution of New York, and the same in legal effect (*Const. of Cal.*, art. 1, sec. 4). No books, tracts, papers, catechisms, or other publications of a sectarian or denominational character, shall be used or distributed in any school, or shall be made a part of any school library; neither shall any sectarian or denominational doctrine be taught therein (*Revised School Law of Cal.*, 1866, sec. 60). We think our friends in California have the true idea of religious liberty.

Sec. 20. Kansas.—No religious sect or sects shall ever control any part of the Common School or University Fund of the State (*Const. of Kansas*, art. 6, sec. 8).

Sec. 21. Prayer in School.—The law is pretty much the same in all the States on this subject. We find it everywhere written in blank. Nothing is more certain, however, than that prayer is allowable when no one objects to it; but it should always be perfectly free from sectarianism. Prayer, if made in the schools established by the State, should be made in the spirit of the laws of the State. But here is the difficulty. It is next to impossible for an individual who is sectarian, to speak and act in every instance in the spirit of laws that are not sectarian. The law, generally speaking, regards all sects and persuasions with perfect impartiality; any teacher who can do the same thing and in the same spirit, we think, may reasonably expect to be permitted to open or close his school with prayer without serious objection. But, in the language of the Constitution of Virginia, "it is the mutual duty of all to practice Christian forbearance, love, and charity towards each other." The teacher should practice forbearance, love, and charity towards the scholars, and towards their parents, and he should respect their opinions and wishes, precisely as he would have his own respected by them. If he can do this sincerely, he will probably be permitted to open or close his school with or without reading and prayer, just as he may deem most agreeable. We hope that no teacher who knows the law, will cease praying through fear. The other and better way will be to make the spirit and the prayer harmonize with the law, and then "walk in the light."

Sowing Wild Oats.—In all the wide range of accepted maxims, there is none, take it for all in all, more thoroughly abominable than the one as to the sowing of wild oats. Look at it on what side you will, and I will defy you to make any thing but a devil's maxim of it. What a man—be he young, old, or middle-aged—sows, that and nothing else, shall he reap. The only thing to do with wild oats is to put them carefully in the hottest part of the fire, and get them burnt to dust, every seed of them. If you sow them, no matter in what ground, up they will come, with long tough roots like the couch-grass, and luxuriant stalks and leaves, as sure as there is a sun in heaven—a crop which it turns one's heart old to think of. The devil, too, whose special crop they are, will see that they thrive, and you, and nobody else, will have to reap them; and no common reaping will get them out of the soil, which must be dug down deep, again and again. Well for you if, with all your care, you can make the ground sweet again by your dying day.—*Dr. Arnold.*

EXACT SCHOLARSHIP.*

OUR "Queen's English" has many strange freaks, but none more capricious, perhaps, than the perfect indifference she exhibits to the derivative meanings of words—the manner in which she allows them to throw off all parental restraints, and fall into the ways and habits of the new generation in which they find themselves. Starting out into the world fresh from home, words carry for a while home influences; but the new phases of life they meet, the rough places they must pass over, the temptations and lures by which the world beguiles them, soon efface these impressions, and they become so changed that you hardly recognize them.

Thus a *physician* was formerly a natural philosopher; now he is often a student of any thing but nature. *Rhetoric* was once the art of a Cicero or a Demosthenes; now, though a man speaks not a word, he employs the art in writing as much they did in speaking. The word *orator* also, if you ask its parentage, will show some very prodigal wanderings; for originally an *orator* was one who prayed in profound submission to the will of God. *Logic*, from its derivation, is as much the science of numbers as of "the laws of human thought and reasoning." And so we might multiply instances, but we can not stay to do so. Search for them, ye who will, and your labor will never be in vain.

A better example probably cannot be found than in the subject of this article. We mean the word *scholar* and its derivatives. The child, whose "young idea" has hardly yet begun "to shoot," is no less a *scholar* in our common parlance, than is he whose daily work has been for years, and still is, to pursue that always infinitely distant point—knowledge. The one imagines it reached and taken into final possession as soon as his first success at school has been gained; the other it leads, as an *ignis fatuus* decoys its victim, on, on, to a point never to be reached—at least, this side of death. The learned commentators on the Greek classics are the *scholiasts*, the *school-men;* the *school-boy* is but a poor disciple toiling in the lowest paths on the hill of knowledge. A *school* is either the humblest place at Wisdom's feet, or the beautiful gardens where sages talked the subtlest philosophy; the place where stern old Dominies flogged us for our mistakes in quantity, rather than for the quantity of our mistakes, or our Alma Mater, where our truly learned elder brothers, whose task it is to assist in the family training, won us by their bright examples to paths of usefulness and honor.

But though our words are prone to wander, need we follow their wanderings? The *scholar* is not the school-boy, nor should *scholarship* imply only moderate attainments. *Pupil* and *student* are modest

* For some suggestions which led to this article, the writer is indebted to a friend and former instructor, Prof. Coppée, now President of Lehigh University.

terms, and, therefore, let our school-boys and college-*men* be satisfied with them. Let him alone whose attainments are great and varied, obtain the honored title, *scholar*. To him alone, whose aim is to view the whole world of knowledge—the cosmopolitan in learning—give the honor; for surely no other deserves it. Can the votary of physical science, who thinks nothing else worth study; can the devotee to literature and metaphysics, who delights in them alone; can the linguist, who finds a reward for his labors only in languages—can either of these be a *scholar* in the strict sense of the word? If so, then he who laughs at the historian and philologist, and lauds the natural philosopher and astronomer; he who spurns metaphysics, as proving

> "God's being so definitely, that man's doubt
> Grows self-defined the other side the line,"

and demands the precision of the exact science in mental philosophy; or he who calls poetry and the fine arts vague, asking "What does the *Paradise Lost* prove?" and demanding a demonstration of the theory of music, —all these are "*scholars*," and compare favorably with him who, by liberal view of the sciences, grasps the whole curriculum and assigns to each its place. No! as the world of man includes all nations, every race; as the myriad sides of the polygon but complete the circumference of the circle; so science, literature, and language are all needed to make up the whole periphery of "*scholarship*."

But more! This scholarship is progressive, and perfection is reached only by progress. Among the Egpytians, astrology held the place of astronomy; to the alchemist a mysterious secret was chemistry; acoustic principles well known to every school-boy now, formerly excited superstitious wonder; comets were signs of the times; eclipses were supposed to be caused by a huge serpent that wound himself around the planet; and other phenomena, to us now plain and simple, were equally the source of "old wives' fables."

But though this progress has gone on, and is still going on; though the scholarship of the nineteenth century has advanced so far beyond that of the middle ages that it is intelligent instead of superstitious, logical instead of fanciful; yet this is not all. There is a step beyond this, and in it we are all interested. I mean that advance which renders scholarship precise, fixed, exact; which gives its possessor power to quote not only the ideas of a writer, but his words also; not only his words, but the work and the place in which they are found; which enables him, in law, to cite authorities and confirm his citation; in Congress, so to bring forward the words of the great statesmen that their influence is felt as if they spoke; in religion, to have a proof for every skeptic, a warning for every hardened mind, "a balm for every wounded breast."

Some few such cases we have indeed seen, but how rare they are!

Such scholarship was Bentley's, who, when Pope read to him his new translation of Homer—a work which was to immortalize his name—remarked, "A very pretty poem, Mr. Pope, but pray don't call it Homer." How vast the attainments which could detect at a single reading no Homeric simplicity, grace, or fire in Pope's paraphrase! Again, it is said of Sheridan that his acquaintance with the Greek authors was so perfect, that on one occasion in Parliament, when the Minister of the Treasury had maintained his point by a citation from a Greek dramatist, he sprang to his feet, and professedly quoting the rest of the passage, accused the minister of having omitted part of the verses. The lines which he supplied were so apt, that his opponent confessed that he must have forgotten the rest of the passage, and Sheridan gained his point. When a friend questioned him, however, as to where the lines were to be found, he acknowledged that he had improvised them for the occasion.

But this exactness of scholarship is very exceptional. Do we not rather see, even among learned men, a want of precision, a lack of exactness, a sort of school-boy, "I know, but I can't think" acquaintance with knowledge, which keeps from the brow, even of those who wear the garland of the scholar, the richer crown of the exact scholar? While, if we mingle in society, we hear one quote Byron and call it Shelley, another Pope's as the words of Swift, while a third has the substance of an author's meaning, but forgets his words, or mixes and confuses both.

We do not speak as from a high tower of excellence to those far below, but as one earnest student to others equally earnest. Probably no one thing has led the writer of this article to give publicity to these thoughts, more than the consciousness of his own failings; and for this reason he calls on all, especially teachers, to set to work to effect a change. Do you ask what change is needed, and how shall we bring it about? Let us awake fully to the want; and if the memory of gray hairs fails to compass this difficult undertaking, let us who are young and vigorous begin the good work. Let the students of our high schools and colleges, the fellows and alumni of our universities see to it, each for himself, that he grows daily more and more exact in his scholarship, by never resting satisfied with any thing short of this high standard. Let us who are teachers, set this point as a goal before our pupils, and never allow any but perfect attainments to pass as sufficient. We know that this is not the work of a day, a term, or even a year; but though we reach it only late in life, yet *then* the honor will be won; the satisfaction with which we can recall the years of life passed away forever, will be real and unbounded. So long as memory is spared—and memory will be the last to fail after such training—so long will the world of knowledge be within us, and no physical weakness can take away our pleasure. The loyalty we swear to learning when we assume the student's gown, demands from us an effort; and no man of education can honorably refuse to do his share.

ISOMETRIC DRAWING.

LESSON IV.

WE will now practice upon some forms produced by cutting away more of the edges of the cube than in the last lesson; but the method of measuring and drawing will be the same as before.

To draw Fig. 20, make a complete cube one inch on each side; then measure from each upper corner three-eighths of an inch on each of the upper lines; this will leave the little spaces MN, WY, etc., each one-quarter of an inch.

Draw from each of the points N, W, etc., a line to the point opposite; that is, from N to T and from W to X, and so on, till each point is connected with its opposite point, as in the figure. Draw faint lines at first, as in drawing the outline of the cube, and then make those parts heavy which are to be retained in the finished figure.

Now draw from the corners or angles, vertical lines as in the figure, each one inch long, and join their extremities to complete the diagram.

The lines which are to be erased in your figure are shown as dotted lines in Fig. 20.

The block represented in Fig. 21 is that of Fig. 20 in a different position.

Fig. 22 is still the same block, but a piece is cut out of the middle. It is easily drawn by first making Fig. 21, then measuring from each end of all the long lines, a quarter of an inch. You will thus have a set of points, which if joined by lines parallel to the lines of the end of the block, will represent the ends of the pieces remaining. After erasing the middle part, which is supposed to be cut away, you will find that there are other lines to be drawn to complete that part which is furthest from you; but by noticing that it is like the nearest part, you can easily complete it.

Fig. 23 is a flight of steps, and is drawn by dividing the lines AE and EF into four parts and drawing lines across as in the figure. Then draw the heavy zigzag line from F to A. Next draw from each angle of this heavy line, a line to the right, and make it the proper length.

Join the ends of these lines and the figure will be complete.

To draw Fig. 24, make the flight of steps complete as in Fig. 23; then measure from the ends of each step a quarter of an inch; connect these points of measurement, and you will have two zigzag lines running down the steps; erase the part between these lines and the figure will be nearly complete. The vertical line from V and the base-line from X will be the finishing lines.

Fig 20

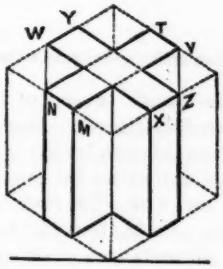


Fig. 21

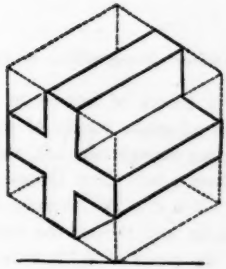


Fig. 22

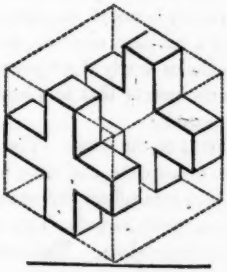


Fig. 23

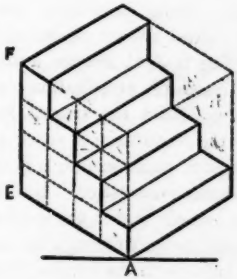


Fig. 24

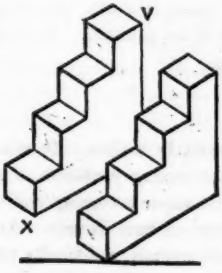
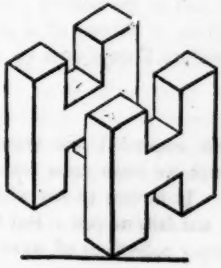


Fig. 25



ATMOSPHERIC PHENOMENA.

II.

Rain.

"No water, no vegetables; no vegetables, no animals; no animals, no men."

THE efforts of nature to maintain the proper balance of life by an adequate supply of water, are incredibly gigantic. Maury estimates that enough rain falls, annually, to cover the earth five feet in depth, or to form a belt three thousand miles wide and sixteen feet deep. The agent which lifts this immense mass is the sun's heat. The force exerted in making and raising the vapor from one acre has been calculated to equal the power of thirty horses; or for the whole area of the earth, a power eight hundred times greater than all the water-power of Europe.* The larger portion of the required moisture is manifestly derived from the ocean and its tributaries; but there are other sources by no means unimportant. Hales ascertained that during twelve hours of daylight a sunflower yielded twenty ounces of vapor, and a cabbage nineteen ounces.† According to J. C. Draper, a man at rest exhales nearly three pounds per day of insensible perspiration; and Sanctoris asserts that in a heated or excited condition the amount rises to five pounds.

For the conveyance of vapor we are indebted to the winds. The greatest extent of water surface is in the southern hemisphere, and there we find the greatest evaporation. But in the northern hemisphere the annual fall of rain exceeds that in the southern by about twelve inches. This can be accounted for only through the agency of the trade-winds. The southeast trade, laden with the burden of vapor from the southern seas, rises at the "Variables," crosses them, as we have already seen, and becomes the upper trade, blowing from the southwest. As it proceeds northward it becomes chilled, and at the calms of Cancer or the "horse latitudes," as navigators term them, it throws off a large portion of its moisture. To this wind northwestern Europe owes its rainy climate.

CLOUDS.

While suspended, the vapor is comparatively useless. It must fall. And here we come upon some of the most vexing problems in meteorology. It is easy to say with Tyndall that vapor becoming chilled condenses and falls as rain. But before the rain we have clouds. As these are simply collections of water-drops, or ice crystals, a difficulty presents

* "Phys. Geography of the Sea," p. 86.
† "Statical Essays," Lond., 1731, vol. 1, pp. 5 and 15.

itself. How can water, specifically many times heavier than air, be sustained in the lighter element? With truly alchemistic subtilty, Descartes asserted that the vesicles of vapor are little spheres of water rendered buoyant by the *materia subtilis* of space. Dr. Franklin maintained that moisture is dissolved in the air as salts in water, and that when the particles are thrown off they hold their place by adhering to the atoms of air. Gay-Lussac refers their suspension to the impulsion of ascending currents of air; and Fresnel supposed that the solar heat absorbed by clouds forms groups of miniature Montgolfières, which rise according to their superior temperature.

Mr. Rowell* recently offered a plausible explanation. In his estimation electricity is the controlling agency. "The atoms of water being so minute, are, when enveloped in their natural coatings of electricity, rendered so buoyant as to be liable, even in their most condensed state, to be carried off by slight currents of air; but if expanded by heat, their capacity for electricity being increased by their increase of surface, they are then rendered buoyant at all times, and are buoyed up into the air by their coatings of electricity; there, if condensed, they become positively electrified, but are still buoyed up by the electricity, till, on the escape of the surcharge, the particles fall as rain." The main objection to this hypothesis is its assumption that electricity is material, while, from analogy, we are led to believe that it, like heat and light, is merely a mode of motion. It is the most satisfactory, but any of the theories we have given may be taken with equal certainty, as "at present we do not possess sufficient data concerning the real constitution of clouds and the properties of the vapors, or the different elements which compose them, on which to ground a satisfactory explanation of their various appearances."†

To account for the precipitation of rain, another disputed matter, Mr. Rowell finds a ready cause in electricity. A particle, freed in some manner from its electrical coating, falls and coalesces with other particles to form drops. By the fall of these and the motion of discharged electricity, a vacuum is formed, and the sudden pressure to fill the space brings more particles into contact and produces more rain. Dr. Dalton held that if two masses of air of unequal temperatures are mixed when saturated with moisture, precipitation ensues; if they are under saturation there will be no precipitation, or if any, very slight.‡ The action of electricity can only be secondary, the main cause is clearly reduction of temperature. The air may remain saturated for several days without a fall of rain, if the temperature is uniform; but a slight chilling of the atmosphere in such cases invariably produces rain. This is now the accepted theory of the formation of dew. It certainly applies with equal force to the formation of rain-drops.

* "An Essay on the Causes of Rain and its Allied Phenomena." Oxford. 1859.
† "Pouillet, Elem. de Phys. et de Meteorol." Tom. ii., p. 754.
‡ "Ure's Dictionary of Chem. and Min." Art. Rain.

DISTRIBUTION OF RAIN.

As has already been stated, rain is unequally distributed over the earth's surface. In some countries, near the equator and along the tropics, it rains almost incessantly during about one-third of the year, and is dry for the remainder. In other regions, showers are frequent at all seasons, but are of short duration; while in others it may be said never to rain. The advance of science has rendered these phenomena easy of explanation. In Ireland an umbrella is almost as essential as a hat. This country lies in the course of the southwest winds, which are merely the southeast trades. These convey the vapor from the southern seas, and also absorb, in their passage over the north Atlantic, much moisture, most of which is condensed by the headlands on the Irish coast.

In Peru, west of the Andes, an umbrella is purely ornamental, and, in a lifetime, one might never luxuriate in a heavy shower. Peru lies in the region of perpetual southeast trade-winds. These cross the Atlantic and strike the coast of Brazil, over which they pass, depositing the vapor as they go, and at length reach the Andes, where their temperature is so reduced that the last particle of moisture is wrung out of them. They cross the mountains as dry winds, and receive no accession of vapor until they reach the Pacific. For like reasons we find rainless regions in Asia, Africa, and Western Mexico. These districts lie under the northeast trades, which, as the geography of the countries shows, are dry winds.

The rainy seasons in tropical countries are caused by the motion of the trades as they follow the sun; at one season the trades prevail, and at another the surface winds, returning to the poles. In some districts lying on the weather-side of mountain ranges, the fall of rain is almost incredible. In Patagonia, where the northwest winds are literally desiccated by the Andes, Capt. King found the fall of water equal to nearly thirteen feet in forty-one days; and Darwin reports that the superficial sea-water along the coast is quite fresh.* Herschel says that nearly fifty feet of rain fall annually at Cherra Pungee.†

ABNORMAL RAINS.

Rains often contain ingredients other than water: Brine showers have occasionally fallen. One of these, which happened some years ago in Suffolk, England, incrusted the trees with salt, and rendered the grass so pungent that cattle would not eat it until forced by severe hunger. Dust storms are not unfrequent in volcanic countries, where also the rain often contains sulphurous acid. In our Western and Northern States, a yellow inflammable substance resembling sulphur sometimes accompanies rain. Naturalists regard this as the pollen of such plants as the alder and the

* "Maury, Phys. Geog. of the Sea," p. 98.
† "Heat, as a Mode of Motion," p. 191.

pine-trees which cover so large a portion of the Southern States. The most alarming of anomalous rains are the so-called blood-rains. Unfortunately, these have never been seen as they fell. In 1608, at Aix, the buildings were found sprinkled with great drops like blood, a phenomenon which produced great terror. The origin of these have never been determined, but they are usually regarded as the excrements of insects. In 1670, the people at the Hague awoke one morning to find their "lakes and rivers turned into blood." While the people were bemoaning their sins, a physician submitted some of the water to microscopical examination, and ascertained that the color was due to an animacule, the horned water-flea.

Not less wonderful than blood-rains are frog-storms, which usually occur after protracted droughts. The frogs appear in vast numbers after the shower. Multitudes maintain that the animals are generated in the clouds, but there can be no doubt that the refreshing rain only revives the creatures and brings them from their holes. Such as have been seen in their fall, dropped under the eaves of houses, whence they had evidently been washed, as they were found in a sadly bruised condition. Signor Redi has shown that if the frogs fell from above there must have been green fields in the upper regions, for their stomachs contained herbs and other food half digested. Fish-storms are not uncommon, and are invariably accompanied by furious hurricanes. Such a storm occurred in a town not far from Paris, in France. It demolished many houses, but in measure recompensed the loss by strewing the streets with fine fish. The celestial origin of these was unquestioned until it was discovered that a well-stocked fish-pond, which stood on an eminence near at hand, had been blown dry. A hurricane once passed over Kent, England, and left the streets of one village deluged with rain and paved with sprats.

After a long period of drought and scarcity in Silesia, there happened a providential shower of manna. As the peasants were about to gather plentifully and eat, a scientific man ascertained that the grains were seed of a species of veronica, set free from their pods by the rain. A similar occurrence took place at Warwick, England, in 1661, and the grateful people were offering their thanksgivings for the providential supply of wheat, when a committee of the Royal Society pronounced the "wheat" only seeds of ivy-berries conveyed thither by starlings.*

ARTIFICIAL PRODUCTION OF RAIN.

A problem of much practical importance, is the artificial production of rain. Among the Bechuanas there are rain merchants or doctors, who by incantations pretend to procure rain.† Dr. Livingstone and Winwood

* The greater number of cases here given have been selected from the "Encyclopedia Britannica" and an article in the "British Quarterly," 1859.

† "Moffat, Missionary Labors in South Africa." Amer. Ed., p. 209.

Reade* give graphic accounts of the ceremonies observed by such impostors in Northern and Central Africa. Even in enlightened countries prayers to Divinities are supposed by some to be of avail.

That rain could be obtained at will was a favorite theory of Arago. He had perceived that great battles are usually followed by heavy rainstorms, and therefore supposed that by repeated discharges of artillery the temperature of the atmosphere could be reduced below its dew-point. His experiments failed to substantiate the theory. Mr. Espy,† who, thirty years ago, was well known as an exceedingly independent thinker and investigator, maintained that in times of drought rain might readily be procured at any time. Having noticed that rain usually succeeds the burning over of woods or prairies, he conceived that if large fires were built in a circle inclosing a considerable area, rain might reasonably be expected soon after in the immediate vicinity. This theory met with much ridicule, but was so clearly borne out by facts, that its correctness is now generally conceded. The process recommended by Mr. Espy is too expensive, however, to come into general use, and practically the problem is still unsolved.

DEMOCRACY IN EDUCATION.

HOWEVER men may differ with reference to democracy in government, there can be little hesitation on the part of any, who have passed through college, in denouncing it in the most cordial manner when applied to the management of an educational institution. Its effect in such cases is not to give all a chance to make progress according to their abilities, but to require all to make progress according to the limited abilities of some; or, in other words, to withhold from many the opportunities to which they are entitled. Industry and talent are robbed, while the standard of education is kept low. In the collegiate contest of mind with *matter*, brain with *skull*, the preponderance of power is given to those who have no claim to it. The requirements necessary for graduation—if these words may be so inaccurately employed—are adapted, with some degree of justice, to the most limited capabilities. But it is unjust that ability, which is beyond the average, should not be duly fostered and furnished with every advantage.

The well-known circumstances are these. A class in college is composed of elements of the most heterogeneous description. In fact, it should be termed a *congeries*—not a class—since the latter term implies similarity on the part of those who constitute it. The Freshmen, however, are so unlike, that they never approximate throughout the whole of their course.

* "Savage Africa." Amer. Ed., p. 289.
† "Philosophy of Storms," by James Espy.

One can not even compare them to the Asymptotes of the Hyperbola, which, although destined never to meet, do yet continually approach. A certain portion have within them a positive, an impellent and progressive power; they are the embodiment of intelligence and energy. The force which influences the majority of their colleagues is negative, retardatory. And yet men who have themselves passed through college, and obtained in after-life the power of rectifying the matter, will still proceed upon the fallacious assumption, that students of abilities and attainments so utterly different may profitably pursue the same course and attain the same proficiency.

The democratic principle is carried out, and, in defiance of fact, it is supposed that "all are born equal" in respect to intellectual capacity.

We give our own experience, although with a pang; for we cannot but contrast what was with what ought to have been. The course was begun with forty odd in company. Some were amply prepared. They were competent to *read* and enjoy the classics—to derive from them the higher advantages which arise from their study—to observe how the thoughtful minds of olden times were occupied; how earnestly and yet how vainly they searched for religious truth. They were ready to learn the lesson which is so important to be learned in our day, and which is taught by no other method than that of classic study with equal impressiveness, that the noblest intellect can not by searching find out God—that the most admirable human culture is not a motive-power of sufficient strength to make men holy. They had learned to decline, to conjugate and scan, in years gone by, and much of what was brought to their attention was entirely familiar, and as superfluous as the daily recitation of their A B C would have been. For other some, it was required of a professor to show compassion. It is a fact that at least one member of the class, of which we speak, was unable to pronounce the Latin words which he was required to translate. How tenderly the shepherd was obliged to guide such wandering sheep!

Now, what was the result of the system which brought together these very unequal elements?

Much of our time was occupied in listening to excuses based on the text of "Not prepared to-day, sir;" or, on those few and far-between occasions, when the reverse was *supposed to be true*, having our risible faculties called into play at the expense of our intellectual. Tragedies became serio-comic under the singular treatment they received. Grammar ceased to be dry, and prosody was made entertaining. Science was made ludicrous as well as entertaining, and an effort at triangulation baffled the gravest intentions. Doubtless this threw a charm over college-life; it might be that the occasions of merriment alluded to were, to some minds, the green and refreshing oases of their wilderness march. But the object seriously proposed was largely interfered with. We made far less intellec-

tual progress than was easily possible. Instead of being wholly *read*, classic authors were partly parsed. The whole of a play was never perused. The intelligent members of the class were impeded in their efforts, like the prisoner fettered to a corpse. Judging of the experience of others by our own, the system of democracy operating in the college, is productive of nothing but harm. Industrious intelligence is positively hindered, by indolent ignorance, from accomplishing its maximum. Like the giant and the child when forced to walk together, the representatives of the former are obliged to shorten their steps in accordance with the abilities of their companions. Why do not our school conventions revolutionize the prevalent state of things, and remove one of the very great reasons for that want of thoroughness which so lamentably characterizes our collegiate education? We flatter ourselves that we are far in advance of the nations of Europe in every thing that concerns intellectual progress. The barbarians come over to this side of the Atlantic to be civilized. The light of knowledge shines, as does the sunlight at the close of day, only in the regions of the West! And yet we have so far humiliated ourselves as to receive some ideas from the old-fogy world. They have made for us the discovery that the earth revolves around the sun, and in other branches of science have made, we must allow, no inconsiderable progress. Why may it not be possible that they have some sound notions which would bear importation in reference to the matter of education?

THE SCHOOLMASTER M.D.*

In the State of New York ('tis a long time ago)
A great operation occurred:
I am speaking the truth, and I'd have you to know
That I am quite willing to swear that it's so,
Or affirm, if you dare doubt my word.

'Twas at Greenwich the school-house I'm speaking of stood—
A battered old shanty, I vow;
Though 'tis twenty years since, it is standing there yet,
On an island not round; if you go there, I'll bet
You will find it the same even now.

And in it, most likely, a hard set of boys,
All ready for any high game;
And of girls, too, quite willing to share in such joys:
All ripe for a frolic and fond of a noise;
In youth, you and I were the same.

* This "Case of Discipline"—written by our contributor, R.W. Hume—is copied, with permission, from *Harper's Weekly*.

But just at the time I am writing of now,
The building was cheerless and lone;
The windows were broken; and only a cow
Seen grazing beneath the old willow-tree bough,
Or a mangy dog gnawing a bone.

And the reason no Busby would take it in hand
Was because of the tales that were told;
How Jack's finger was cut, and Joe rolled in the sand
By the widow's son Dick, and the Hollingshead band
Were licked by Tom Raynor the bold.

Then duly next morn came the mothers to pray
That the teacher would cowhide them well;
Or if Dick and Tom Raynor were not sent away
They wouldn't send Johnny nor Joe ne'er a day,
And would take away Kitty and Bell.

Poor teacher! Each day he was bothered and pained
To settle the wars of the eve,
Till, with patience exhausted, he fairly complained
"No mortal could stand it;" and further, proclaimed
"That he had determined to leave."

'Twas long ere another was willing to try
The place thus vacated and lorn,
Till a grave learned Doctor, who that way passed by
And heard of the trouble, without if or why,
Declared he would work a reform.

Being duly installed in the schoolmaster's seat,
The day passed without any rub;
But a friend sent next morning a note short and sweet,
To hint that a stick was no weapon discreet,
As his boy had been struck with a club.

'Twas read; and the boy was called forth rather gruff,
And asked to exhibit his wound.
So, sniv'ling and wiping his nose on his cuff,
Georgy Williams his trowser pulled up with a snuff,
And held out a leg which was sound.

"Is it here?" said the teacher; "why, this is a burn."
"Oh no, sir; 'tis here on the shin."
"'Tis a very grave case," said the Dominie stern;
"It might have been fatal." Though, reader, you learn
It scarcely discolored the skin.

"Why, Georgy, my son, did you walk to the school?
I declare it was rash so to do.
But as you are here you must sit on this stool,
And hold up your leg like a parallel rule
To the maps which hang here in your view."

Then taking him gently with tenderest care,
In a loving and fatherly manner,
He called for a cushion, and then for a chair,
And seating poor Georgy, he placed his leg there,
And bandaged it with his bandana.

On further inquiry, the Dominie found
The name of the other young sinner
Who struck the foul blow; and in justice was bound
To call for his aid when the play-spell came round,
To bring Georgy Williams his dinner.

And he made him all day like a lacky to stand,
Or a priest doing penance for sins;
To hold Georgy's slate, and to place in his hand
Ev'ry book he required. While Georgy, right grand,
Sat in state,—like a monarch on pins.

With his leg for a sceptre, stretched out on a chair,
He sat through the ne'er-ending day;
While Harry, the villain, did wait on him there,
And with rueful compunction his sorrow did share,
For neither could go out to play.

And when studies were o'er, lest the lame little lad
Should be to his sister a drag on,
The Dominie said, She must speak to her dad
To gear up his horse, as the walking was bad,
And send down for George the light wagon.

Next morning the patient all rosy appeared,
Declaring his trouble was o'er.
And when his preceptor's inquiry was heard,
"How's your leg, Georgy Williams?" he stoutly averred
"It was better than ever before."

And in the prescription such virtue was found
(If you use it I don't care a peg),
That no child ever threatened, while playing around,
To tell of a hurt got on Greenwich school ground,
But was met by the cry, "How's your leg?"

THE STRAIGHT MARK.

CHARACTERS:

MR. RUSSE, *a new teacher.*
RICHARD, SAMUEL, WILLIAM, JAMES, HENRY, NICK, NED, and others, } *School-boys.*

SCENE—*A School. Teacher at his desk—Class before him.*

Mr. Russe. The class will now recite in arithmetic. Books aside. Those at the seat will work the examples on their slates. Richard will take the board. [RICHARD *goes to the blackboard.*] I shall give you, this morning, an original example suggested by the recitation.

James. I can't do these sums, Mr. Russe.

Mr. R. Can't! Was that your word?

Henry. They're awful hard, Mr. Russe.

Mr. R. Very hard you mean; not *awful.*

Samuel. [*Whispers.*] Bill!

William. Hulloa!

S. Play ball after school?

Mr. R. Some say they can not do the examples. Let us try one of them. Attention. [*Reads.*] *You have* 18 *bushels of corn at* 48 *cents a bushel*— [RICHARD *writes on the board; the other boys, on their slates.*]

W. [*to* SAM.] I speak for first base.

Mr. R. [*Reads.*] 8 *bushels of rye at* 52 *cents*—

S. [*to* WILLIAM.] I'm pitcher.

Mr. R. No whispering! [*Reads.*] 4 *bushels of wheat at* 85 *cents*—

H. Say, Sam.—Look out, he's looking

Mr. R. Samuel, are you whispering?

S. I am not, sir.

Mr. R. Were you? That, of course, is what I mean.

S. When?

Mr. R. Just now, when I looked up.

S. No, sir.

Mr. R. Have you been?—that is, since we began the recitation.

S. Yes, sir.

Mr. R. A boy who tells the truth is a good boy. It seems that a good boy may be inattentive. [NICK *draws a variety of trifles from his pocket.*] Samuel will attend.

S. Yes, sir. But I can't understand.

Mr. R. Richard will try to make it clear presently—[*Reads*]—*And would mix the whole with grains worth, one kind,* $\$1\frac{25}{100}$ per bushel. [CHARLES *takes some of* NICK'S *playthings, and* NICK *snatches for them.*]

Nick. Here!—give me those!—

Mr. R. Boys! Nick, where's your slate? [NICK *takes his slate.* Mr. RUSSE *reads.*] *The other at* $\$2\frac{12}{100}$ *per bushel*—

H. [*whispers.*] Say, Sam, didn't the Atlantics do the big thing? Twenty-seven to seventeen! [SAM *shakes his head and looks at the board.*]

J. [*whispers.*] Hoh, the Eurekas can beat 'em any day.

Mr. R. Whispering again! Come, come! Attend to the example. [*Reads.*] *How much of the grain at* $\$1\frac{25}{100}$ *per bushel, and of that at* $\$2\frac{12}{100}$ *per bushel—*

J. [*whispers.*] The Actives thought they were going to—[Mr. RUSSE *looks that way.*]—Mr. Russe, how do you begin that sum?

Mr. R. The explanation will be given in a minute. [*Reads.*] *Must you mix with the other three—*

J. [*whispers.*] The Actives thought they would do the soft thing when they played with the Eurekas—

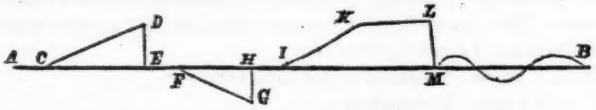
Mr. R. [*sharply.*] Attention!

J. [*aside.*] Mr. Russe is getting up steam, ha! ha! ha!

Several Boys. Ha! ha! ha! [NED *strikes at* NICK *with his slate, and the slate falls to the floor.*]

N. Get out! [NED *looks innocent.*]

Mr. R. [*Rising from his chair and facing the class. All attend. He goes to the board and draws the following figure:*



Turning to the boys.] Do you see that straight mark, AB?

All. Yes, sir!

Mr. R. That represents the study or recitation hour. Now, if you should begin at A—as some of my boys here do—and attend to your work right through to B, you would, with rare exceptions, have your lessons from to day. But you do not so attend. Some of you begin at A and study on to C, when the thought of something else pops into your head—some kind of amusement, a base-ball match perhaps—and off you go from the straight line of attention to your study to D. Suddenly you remember that you have a recitation before you, and down you come to the straight line again, having lost time however, from C to E.

S. Mr. Russe, you've told us that a perfectly straight line can't be drawn.

Mr. R. I'm glad you remember it, Samuel. But that is now a departure from the straight line of attention to what we are considering. It is like the departure noted by the line FGH, by which we lose the line FH. Nick, what are you doing?

N. He keeps getting my things.

Mr. R. Ah, now you are going towards K! Nick, do you see—does the class see, that Nick and Ned are losing time by turning their attention to something else?

Boys. Yes, sir.

S. We are all losing time, too.

Mr. R. Certainly. Put those things into your pocket, Nick. Now, suppose we go back to H. You begin there to study again, and you attend to work till you get to I. There the thought of something else pops into your mind—a big apple you're going to eat, perhaps—

All Ha! ha! ha!

Mr. R. You think about the apple, and all the while you are going away from AB towards K, and there you think of something else—a new bat, perhaps. Is it not so?

Several. Yes, sir.

Mr. R. Well, you think about the new bat till you get to K, and then you get into a boyish reverie, in which you keep on thinking of apples, and bats, and balls, and other things, till you are suddenly started by the remembrance of your lesson; so back you dart to the straight mark and try to be attentive; but thoughts of balls, and apples, and bats, and games, mingle confusedly with the matter of the lesson, and that is represented by the curved line from M to B. Do you see?

Boys. Yes, sir.

Mr. R. Now sum up and see what you have lost. All that part of the study or recitation hour from C to E+F to H+I to M+fully $\frac{1}{2}$ M to B!—about $\frac{2}{3}$ AB—that is, about two-thirds of the time. Is it a wonder you come here and say *Can't?* Away with the word! *Can't! Inattention* rather. When you meet with difficulty, work at it. If in due time you don't succeed, then come to me. But never again say *Can't.* Now for the remainder of the example. So much as I have read, Richard has on the board. Those who have been inattentive may copy it on their slates. [*Reads.*] *That the mixture may be worth a dollar a bushel?* [*All the boys give close attention, copying the example on their slates.*] I wish to leave the room a few minutes. I shall expect you to be attentive and to behave yourselves. [*Exit. Boys maintain order and work at the example.*]

J. [*presently.*] I've got it!

H. So have I. Mr. Russe rather got us on that line—

S. Hush! Don't whisper! [*Silence again.*]

[*Enter* Mr. Russe.]

Mr. R. Boys, your conduct pleases me. So let it ever be! How many have finished the example? [*Nearly all raise their hands.*] Very well. Now can you tell me what other lesson you have had this morning?

All. The Straight Mark!

Mr. R. True. And what have you learned by it?

All [*together*]. To be attentive—never say can't—keep to the mark!

Mr. R. Will you remember it?

All. Yes, sir.

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Scholastic Rights and Duties of Parents.

RIGHTS and duties are inseparable; they must be accepted or rejected together. In the case under consideration they center on one common object, namely, the welfare of the children; and since they have but one end, it is evident that they should operate together. Separate them, and in many cases they may and do nullify each other; unite them, and almost any thing desired can be executed.

Education means simply "leading forth." Physical education may be compared to the attention given to the proper construction of the human locomotive; intellectual education forms and develops its motive-power, and moral education applies this power to its proper use—instructing it how to labor for the common good of society. It is yet very questionable whether these portions of one whole can wisely be separated and placed under different delegate authorities. It is certain, however, that they all center under the proper charge and special supervision of parents.

Notwithstanding this general admission, it is singular, and much to be regretted, that both here and in Europe, many if not most writers on the subject of education ignore or forget the use of parental power. Their strictures refer to children and teachers, whilst the rights and duties of parents are very rarely discussed. To make no use of these highest natural authorities, is to set them aside as worthless. Is this wise? Consider how important a part for good or evil home education is constantly performing!

First, then, parents have supreme right over their children. Any other authority exercised by the State, city, or another individual, is only delegated. Penalties for neglect of duties by parents or their delegates are therefore naturally and rightly visited upon the former in after-life.

In order to make a proper choice of a delegate, parents have a right to enter a school during working-hours. The capacities of children are so various, that the abilities of a teacher cannot always be correctly estimated by an examination of his pupils. One hour's careful inspection of a school in action will give a better idea of the trustworthiness and capa-

bility of a teacher, than a volume of regulations, or a yard of printed references. To neglect this duty, is, on the part of parents, a serious error.

Parents have no right to expect more than a simple recognition of their presence in the school-room, inasmuch as teachers are paid for the use of their time, and have no right to appropriate the time set apart for tuition to other purposes than those for which they are remunerated.

It is not wise for parents to take counsel of their children with regard to what school the latter prefer, for it is natural in them to prefer play to study.

If parents wish their children to respect a teacher and to improve under his training, they will do well not to relate their own youthful delinquencies and school pranks, in the presence of their little ones, unless they desire them to be imitated, with additions and improvements, first at school, afterward at home.

It is miserable policy on the part of parents to threaten children with the school as a place of punishment. It forms a barrier which must be removed before children can pass up the hill of knowledge.

Having selected an instructor, it is the duty of the parents to support his ordinances as supreme laws over their children at home, as well as at school. Any clashing between parental and scholastic authority is productive only of evil.

When parents can be relied upon, teachers can render the simplest home deprivations the most effectual punishments. Latitude in amusement should always be regulated by high or low standing in the school.

When parents neglect their duty, they set before their children a lesson in negligence. To forget to sign the weekly report, is to lead them into paths of disorder and disobedience. It is an unmanly wrong done to the teacher, and a grievous injury to the children.

Parents who, to please themselves, sacrifice their children to ignorance, by constantly writing excuses for their lessons, are very reprehensible. Three regular exemplars of this crime are sufficient to demoralize a school.

The public will is, in this country, supreme. Parents should understand that they form and model the systems in operation in our public schools. If they demand the right to elect politicians to perform solus their proper parental work, they have little right to complain if it be ill done. In private schools the same carelessness on the part of parents, as to the use of the right of their supervisory powers, begets carelessness in the children, and sometimes in the teachers. For the many aberrations

which spring from this neglect, fathers and mothers, the blame rightly rests on yourselves.

Oh for some Horace Mann to publish a work on this subject! Principals of Schools and Teachers have been lectured, addressed, written to and written at, in order to post them well as to the best methods of performing rightly their parts in the great work in which they are engaged. Volumes upon volumes have been addressed to children and youths with the same purpose and intent. Alas! even in our most elaborate educational compilations how short and how few are the paragraphs devoted to the instruction of parents with regard to their duties; how little care has been taken to obtain their co-operation, or to secure their aid and power over their families as instruments requisite to and necessary for the full development of all that is worthy of commendation in any system, either of public or private school education!

Teach Principles.

PRINCIPLES are few, and widely applicable. Details choke the world with fullness, while but few can be acquired individually. A principle explains and prepares the way for the acquisition of a multitude of details. Let more of principles, then, be taught, and fewer isolated facts which point—*somewhere.* Put a principle into a child's consciousness, and he will inevitably acquire the corresponding details easily and orderly. And, animated by a spirit of intelligent inquiry, wherever he goes in God's beautiful world, he will have eyes open to see, and mental hands to reach out and take hold of, and classify, and understand, and possess.

Do away with details? No! introduce as many of the most important as possible. Introduce them by incidental remark, by talks, by lectures; but do not *cram.* Many an ambitious pupil *crams* for the highest grade; and, when graduated, is stuffed, not taught, overloaded with unclassified facts—not educated. Often he is mentally burst and physically broken, and, after all, knows much less than that obscure pupil far down in the class, whose eyes have gleamed as a living principle has flitted past him, to be inquired about, but lost for want of time—or caught, perhaps, in that momentary flash, and made his own.

We need a great reformation here. We must come back to generals, in order that we may get details into the pupils' minds in an orderly and

practicable manner—in order that the pupil who graduates first may not be the broken-down hack of the class; and that he who does not graduate first, may be the one whose mind is dullest at perceiving principles. We do not assume that principles are not taught in our schools; but they are not taught characteristically, while details are.

Much is said about cultivating individuality in pupils. But the common mode of teaching details ignores individuality. Details are acquired by the mechanical memory—a faculty differing in scope, among pupils, but by no means individualizing. The thinking power, it is, that individualizes. Principles demand thinking. So do details, when they are acquired by the philosophical memory after being classified by principles; but not as taught apart from the consideration of principles first.

Character.

IF the human mind were a passive recipient, its worth might be estimated by the amount and quality of its contents. But mind is active. It converts crude knowledge into power, and power is a blessing or a curse according as it is used. If individual character is properly developed, and fortified by correct habits, knowledge is beneficent and can not be too largely increased. But if character is undeveloped, or unbalanced, or perverted, every increase of knowledge serves but to increase the means and opportunities for doing evil.

An honest citizen, though unlearned, is worth far more to the State and to society than the most accomplished rascal. While for personal happiness no amount of information will atone for a lack of wisdom; and wisdom depends not merely upon the amount and kind of knowledge possessed, but upon character, which insures its proper use.

It is a question, therefore, whether our splendid appliances for wholesale instruction are the best possible means for the education of children.

The great object sought in them—and, in fact, the only object that can be successfully attained by teaching *en masse*—is the dissemination of knowledge. That which is of far greater importance to the individual and to society, the formation of correct habits, the implanting of correct principles, and the rousing of generous impulses, is thrust aside, as being without the sphere of the teacher's duties.

We know that it is rightfully the parent's duty to attend to this part

of education. But many parents are incapable of doing it; many others are too negligent to do it; while no small proportion even of those who are capable of doing it, shirk their responsibility by sending their children to distant schools, during the entire period when they most need parental supervision, and are most susceptible to its influences. The consequence is, if this work is not done by teachers, it is rarely done at all; and where the school system largely excludes such training—as in our cities and large towns—we have multitudes of children who are *smart*, but are neither virtuous nor honest. So long as the development of character is sacrificed for greater development of brain, just so long will our educational system prove a disappointment; and we have but ourselves to blame for the result.

The Year.

IN educational affairs, radical changes are of rare occurrence. Progress is generally made by stages almost imperceptible; and at the end of a period so brief as a year, it is difficult, if not impossible, for a casual observer to detect any change.

As in a forest growth, the general appearance may not be perceptibly affected, yet one who has spent the year within its shadow, may discern here the beginning of a mighty tree, or a slender twig, the promise of a thrifty branch; there, a last-year's shoot untimely withered, or dead tree fallen, while everywhere are evidences of a constant though immeasurable growth: so in the wide field of education, though there may be little apparent change since the year began, we know that change has been incessant. And though cherished projects may have failed, though new evils have crept in, and old evils have been unsuccessfully assailed, we are persuaded that over all there has been progress—that the aggregate result is improvement.

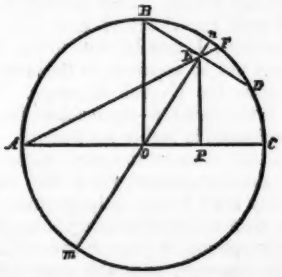
Would that it were greater!

The ancients educated their children not merely by talking to them, but also, and especially, by means of examples and actions; in order that what they acquired might remain in their minds, not as a science, but as a nature and custom inseparable from them—not as a thing learned, but as an inherited possession.—*Montaigne.*

EDITORIAL MISCELLANY.

A DEMONSTRATION of the following construction was given in our last number. It was received after our usual time of going to press, and hurried through with too great a reliance upon the reputed ability of the contributor and the accuracy of the proof-reader. We have in consequence to apologize for errors, typographical and other, which unfortunately escaped our notice.

To construct within a Circle a Line whose Square shall Approximate to the Area of the Circle.



Take the radius of the circle as the unit of measurement. Draw the radius OB at right angles to the diameter AC. From B draw the chord BD, equal to radius; bisect it at E, and, through E, draw the chord AF, which is the line required.

Through E draw O*n*, and EP at right angles to AC. Since BD=R, it is the side of an inscribed hexagon, and therefore the arc BD=60°.

The following results are derived:

Arc B*n*=30°. Angles BOE and OEP each equal 30°. Angles EOP and OBE each equal 60°.

$BE=\frac{1}{2}BD=\frac{1}{2}R=\frac{1}{2}$. $OE=\sqrt{OB^2-BE^2}=\sqrt{1-\frac{1}{4}}=\sqrt{\frac{3}{4}}=\frac{\sqrt{3}}{2}$.

Triangles OEP and OBE are similar $\therefore$ OB : BE : : OE : OP $\therefore$ OP $=\frac{BE\times OE}{OB}=\frac{\sqrt{3}}{4}$.

$AE\times EF=BE\times ED=BE^2=\frac{1}{4}$ $\therefore$ $EF=\frac{1}{4AE}$.

But $AE^2=AO^2+OE^2+2AO\times OP=1+\frac{3}{4}+2\times\frac{\sqrt{3}}{4}=1+\frac{3}{4}+\frac{\sqrt{3}}{2}$.

$\therefore$ AE=1.6174131827.....

$EF=\frac{1}{4AE}=0.1545678016$.....

AE+EF=AF=1.7719809844.....

$AF^2=3.141592653$ ..... =area of circle.

The contributor of this simple and excellent demonstration justly says: "So nearly does the result approximate to π, as obtained by the usual methods, that the question is well put, whether this construction would not give us the *exact* value of π, if only the value of $\sqrt{3}$ could be ascertained; in other words, whether the square constructed on chord AF is not really equal to the area of the circle."

EDITORIAL CORRESPONDENCE.

MR. EDITOR—Some time ago you spoke of exposing in your Monthly some of the absurdities taught in our schools. From what you said at that time, I supposed that you had in course of preparation a series of articles on that subject. If some person would begin with the Primary school, and set in the light the stupidity of teachers there, and follow on through the Intermediate and Grammar departments to the academies and colleges of the land, much good might be done for the public, and the interests of the pupils would be well served.

Because the articles to which you referred have not appeared, I now speak. I am not on the course. I am too old to go down to the fight, but by the light of past experience (I have lived longer than the time allotted to one generation), I may be able to see the bearing and results of some plans that may not be apparent to the more youthful.

It is absurd to despise the English language. This is done by nearly all classes of people in this country—by teachers in our public schools and academies, and by professors in higher institutions.

The boys and girls that compose the great majority of our schools have not time to learn the dead languages; yet if they expect to maintain a respectable standing, they must devote a large share of their precious time to acquiring what to them will be absolutely valueless. According to the present state of public opinion, a year or two of Latin will atone for ignorance of the English language, miserable penmanship, ignorance of ordinary business transactions, ignorance of Latin itself, and, in short, for general stupidity. One who has taken his "course" in Latin and Greek is thought to be master of great mysteries, however superficial his knowledge of these languages may be. His pedantry is encouraged, though he cannot correctly translate a line not previously taught him. This ignorance is more common than most people suppose.

I care not how extended a course of study may be, if, when completed, the pupil have not a thorough and exact knowledge of the English language in regard to reading (as but few can now read), spelling, grammar, rhetoric, English classics, and history, and unless he have power to write his thoughts, as well as to give oral expression to them, in proper words, such a course is not fit to be recommended to American youth.

Do not understand that I object to the study of any or all languages except our own. Not so. But nine-tenths of those who commence the study of Latin and Greek would receive much greater benefit by devoting their time to the study of natural history, practical business transactions, and the English language as it is *not* taught in our public schools, academies, and colleges.

One word on the Teachers' Association at Geneva.

Your criticism is severe. I will not say it is unjust. But you use the names of two ladies, who stand high as teachers of elocution, rather too lightly. I cannot think their readings were out of place at an association of teachers, though such exercises should not form "the main attraction."

The responsibility for lack of vigor in the association lies with the officers who had immediate charge of its meetings, though they cannot justly be charged with intentional wrong.

The local committee and the people of Geneva were very kind; and I think they must have been amused and amazed at the display of capacity for entertainment by the teachers.

The officers of the association, at the outset, should have given all to understand that the teachers had met for the transaction of business, according to programme; and the very kind attentions of those who would divert the association from its proper course, should have been politely declined.

Many of the teachers saw the lack of proper management with mortification. Some who very much desired to speak on the few practical questions presented, could not do so for want of time; and at least one important topic on the programme was passed by for the same alleged reason.

We hope for better things next year at Auburn. I hope you will go, even if you take your "ax" along, and have but a psalm or song to edify or amuse. Very respectfully, T. O. Garfoote.

MR. EDITOR—The ill-tempered letter of F. S. J., in the November number of the Monthly, reminds one of the homely proverb concerning the impropriety of stone-throwing on the part of those who live in glass houses. He fails to see that the invectives which he hurls at your critic and his supposed theory of grammar, may and do rebound to the destruction of his own theory. Caring little for Clark's Grammar, and still less for most others, I am interested in this controversy only so far as it affords an excellent illustration of the general inefficiency of grammatical teaching.

The critic's assertion that it does not make good *practical grammarians*, or, in other words, that it does not enable pupils to speak and write the English language with elegance and propriety, is strictly true. But, protests F. S. J., assuming that the charge is made especially against his favorite system, "Nine-tenths of the current teaching of grammar is the product of systems and text-books that have been from time immemorial (!) utterly oblivious of the analysis it (the review) condemns; and the defect, therefore, is not due to the existence or influence of Clark's Grammar." Evidently, the reviewer did not mean to say that it is due to Clark's Grammar; he merely stated, generally, the fact which F. S. J. tacitly admits to be nine-tenths true.

Now, is there any good reason for excepting the other tenth? Are the disciples of Clark remarkable for the use of correct, elegant, idiomatic English? The pedantic style of the champion of Clark's system certainly does not afford much reason for attributing any peculiar excellence to its influence. So perfect is his command of the school-boy militant style, that one might almost be justified in supposing that he had acquired his knowledge of English composition entirely from the study of the essays of "juniors," with, perhaps, a slight acquaintance with the letters of "Junius."

The truth is, both F. S. J. and your critic are wrong. They assume that "English grammar teaches the proper use of the English language,"

and then find fault with this or that text-book, because those who study it do not, in consequence, become good writers.

The fault lies deeper, and a radical change must be made in our teaching before we can justly expect satisfactory results. Our grammars teach a good deal *about* the English language—though, unfortunately, much that they teach is not worth knowing—but they do not teach pupils to "give thought graceful and proper expression in words," simply because language is not a thing to be learned by rule or precept. We might as well expect to teach a child to dance by making him repeat the names and uses of his bones and muscles, as to expect him to become a master of his mother tongue by such exercises as *John is a noun, proper, third person, singular number, masculine gender, and in the nominative case.*

Very respectfully,

Here, November 10, 1866. R. S. J.

SCIENCE AND THE ARTS.

—M. Favre thus describes the process by which he supposes silver to be transmuted into gold. A certain quantity of pulverized chlorid of ammonium is dissolved in aqua ammonia. If the solution be turbid, it must be filtered; chlorid of silver, perfectly white and humid, is then added and the bottle well shaken. The chlorid of silver is dissolved, the solution becomes yellow and deposits a precipitate of the same color, which must be collected carefully. The characteristics of this powder are: 1. When introduced into aqua regia it is completely dissolved, and a new addition of ammonia precipitates it; 2. it is not fulminating; 3. it furnishes gold when placed between the poles of a Bunsen or Grove batttery.

—According to a German author, the number of useful plants has risen to about 12,000; but it must be remembered that these researches have been completed only in certain portions of the earth. There are no less than 2,500 known economic plants, among which are reckoned 1,100 edible fruits, berries and seeds; 50 cereals, 40 uncultivated graminaceous seeds, 23 of other families; 250 comestible rhiromes, roots and tubers, 37 onions, 420 vegetables and salads, 40 palms, 32 varieties of arrow root, and 31 sugars. Vinous drinks are obtained from 200 plants, aromatics from 266. There are 50 substitutes for coffee, 129 for tea. Tannin is present in 140 plants, caoutchouc in 96, gutta percha in 7, resin and balsamic gums in 389, wax in 10, grease and essential oils in 330; 88 plants contain potash, soda, and iodine, 650 certain dyes, 47 soap, 250 fibres which serve for weaving, 44 for paper making, 48 give materials for roofing; 100 are employed in building; 740 are used, and there are 615 known poisonous plants. According to Endicher, out of the 278 known natural families, only 18 seem to be perfectly useless.

—It appears that Canada is no longer entitled to be considered as the sole depository of the earliest fossil hitherto discovered. Recent laborious researches made by Professor Hochstetter, of Vienna, have resulted in the discovery, in the calcareous limestone of the Krumman, of undoubted specimens of Eozoon, in all respects similar to those found in Canada.

New Process of Making Steel.—M. Galy-Cazalat has discovered a new process for the rapid conversion of cast iron into homogeneous and pure cast steel. It is known that pieces of steel cast in moulds are full of cavities, considerably weakening their tenacity. The rolling or hammering required to cause an adherence of the particles of the metal is very costly, and sometimes impracticable. It occurred to M. Galy-Cazalat to cause these cavities to disappear by submitting heavy guns to great pressures produced by gases while the metal is still in a fluid state, in the moulds of sand, firmly bound by strong frames of iron of suitable resistance. For this purpose, immediately after the casting of the complete cannon, the whole is covered hermetically by a metallic cap, screwed firmly to the framework of the mould. The cap carries a vertical tube, furnished with a cock at the lower extremity, and closed at the top by a less resisting membrane, or safety diaphragm. It contains six to ten grammes of powder, without sulphur, composed of eighty parts of saltpetre and twenty parts of charcoal. The imprisoned gases under the cap exert on the surface of the liquid steel a pressure, which is transmitted simultaneously and regularly through the entire mass of the cannon, effectually effacing the bubbles, and increasing the tenacity of the metal, which is the same throughout. By this process he succeeds in avoiding many of the difficulties incident to his own and to Bessemer's method of making cast-steel, one of which was, that the steel produced by them had to be re-cast so as to become homogeneous and of superior quality, which second operation, carried on in crucibles containing 44 pounds, doubled the cost of homogeneous cast-steel.

—Dr. Reichenbach, of Vienna, thinks that there exists throughout space a cosmical powder, or dust, which sometimes becomes agglomerated, so as to form meteorites, and at others reaches the earth as an impalpable powder. Meteorites are composed mainly of nickel, cobalt, iron and phosphorus. Some dust, collected by Reichenbach on a mountain top, previously unvisited, gave, upon analysis, nickel, cobalt, phosphorus and magnesia. Dr. R., therefore, thinks that we have an invisible rain of meteoric dust, from which is derived the minute quantity of phosphorus, so generally distributed over the earth, and so necessary to vegetation. This hypothesis is very pretty, but not yet established.

—Fine coloring matters, soluble in fatty matters, paraffine, and similar hydrocarbons, and capable by mixture of producing any number of intermediate shades, have been discovered in the form of metallic soaps. They are obtained by precipitating various metallic solutions with soda soap. In this way the salts of iron afford a brown orange stearate; those of copper, a malachite green; those of nickel, an emerald green; those of chromium, a green which changes to violet; those of uranium, a bright yellow; those of cobalt, a lilac; and those of manganese, a rose red.

—A new use for the products of the distillation of petroleum and coal has been found. The resulting volatile hydrocarbons have the property of dissolving all the more common vegetable oils, as palm oil, olive oil, linseed and rape-seed oils, and the like. The seeds or fruit containing the oil are first crushed or ground, and digested with the hydrocarbon in hermetical vessels. The oil is gradually taken up by the volatile agent, which is afterward driven out by distillation. The solvent is condensed, and thus very little loss results, while the yield of vegetable oil is from 40 to 50 per cent. more than by pressure.

EDUCATIONAL INTELLIGENCE.

EASTERN STATES.

MAINE.—The Agricultural College will go into operation next spring.

MASS.—Lee Claflin has given $25,000, and his son, Lieutenant-Governor William Claflin, $10,000, to endow the Methodist Theological Institute of New England.

CONN.—Mr. Peabody has given Yale College $150,000, for the purpose of establishing a scientific museum.

MIDDLE STATES.

NEW YORK.—In October, Loring Andrews, Esq., of this city, gave $100,000, and two other gentlemen $10,000 each towards the endowment of the University of the City of New York. The total endowment of the institution is now nearly $500,000. We are gratified to record the prosperity of this University, whose claims upon the public are excelled by no other. To one of its professors, Morse, we owe the telegraph; to another, Draper, we owe the daguerreotype, and another, Loomis, now of Yale, published, during his connection with it, one of the finest mathematical series in the English language.

—The Finance Committee of the Board of Education of New York city estimate their expenses for 1867 at $2,522,000, of which $1,580,000 are for teachers' salaries. The salaries of teachers are as follows:

Male Departments.—Principals (based on attendance of pupils) from $2,000 to $3,000; Vice-Principals, $1,800; Male Assistants (average), $1,200; Female Assistants (average), $675.

Female Departments.—Principals, $1,200; Vice-Principals, $900; Assistants (average), $600.

Primary Schools.—Principals, $1,012.50; Vice-Principals, $790; Assistants (average), $450.

Special teachers are paid for the time actually employed.

EVENING SCHOOLS.

Male Departments.—Principals (per night), $3.50; Male Assistants (per night), $2.50; Female Assistants (per night), $1.50.

Female Departments.—Principals (per night), $2.75; Assistants (per night), $1.50.

The salaries of teachers in Corporate Schools are regulated by the Trustees and Managers of the institutions in which they are employed.

WESTERN STATES.

ILLINOIS.—The family of the late Jesse Funk have founded a library in the Illinois Wesleyan University, to bear the name of their father.

MISSOURI.—Several regiments of colored troops have contributed nearly $7,000 to establish a school at Jefferson City for the education of colored persons.

CALIFORNIA.—The Baptists are about to open a denominational school at Petaluma, under the charge of Professor Mark Bailey, and propose to raise $40,000 for its endowment.

OREGON.—The number of schools in the State is 443—an increase of 100 in two years—with an average attendance of 11,144.

SOUTHERN STATES.

VIRGINIA.—There are five free schools for whites in Richmond, and a Boston society has sent an agent to establish similar schools throughout the State.

—The Chesapeake Female College, near Fortress Monroe, is to be converted into a theological seminary for colored youth, under Baptist patronage.

TEXAS.—The Legislature is about to establish a State University; a bill for its location and construction has been introduced and referred.

FOREIGN.

ENGLAND.—*The Educational Times* states that the important subject of university extension, by the establishment of colleges for poor students, continues to engage the attention of the authorities at Oxford. The sub-committee, presided over by the Rev. Dr. Shirley, recently appointed to consider the question, have made a report to the effect that a new college or hall must be opened to give the benefit of the university to a class of men who cannot now enter. They suggest that in the proposed establishment "the charge for tuition be £4; for furnished rooms, £3; for battels, £10 a term; Easter and Act terms to count as one, making £51 per annum. The payments for each term to be paid in advance. In the battels would be included breakfast, plain luncheon, dinner, attendance, and the general lighting of the college." Another recommendation is, that breakfast and dinner be in common, the principal and tutors being for the most part present at those meals. Economy being the essence of the scheme, it is provided that "if any member contracts debts beyond a certain amount, or be found to be forming expensive habits, he be requested to remove to some other

college or hall, as not being the character for which this foundation is instituted." Facilities are also to be given for remaining in residence out of term.

SCOTLAND.—The number of students attending the Scotch universities are as follows: Edinburgh, 2,400; Glasgow, 1,165; Aberdeen, 898; St. Andrew's, 869.

FRANCE.—The Senate has again rejected the proposition that ability to read and write be made a qualification for holding office in a town council, for the reason that in many small *communes* persons possessing all the qualifications, and able to read and write, cannot be found.

—Education is liberally supported in the Isle of Bourbon. At present, $120,000—more than one-eighth of the whole revenue—is devoted to teachers' salaries. Primary instruction is gratuitous, and there is a great classical school, with five hundred pupils. The island depends upon France for its supply of teachers.

HOLLAND.—Secularization of the primary schools is much discussed in this country. Attendance upon school is neither compulsory nor gratuitous, but there are few children of the legal age who do not attend either government or private schools.

SPAIN.—The law provides for the establishment of schools, both male and female, in all parishes with five hundred or more inhabitants, and attendance is compulsory. The poor receive free education. The law is not well enforced. Male teachers receive a free house and from $125 to $500 per annum, and female teachers receive two-thirds as much.

SYRIA.—A revival of education is in progress here. A correspondent of the New York *Tribune* gives the following details:

"In the reign of Justinian the law school of Beirut had a world-wide celebrity. To-day seven of the largest and most imposing edifices in Beirut are institutions of learning—four of them Protestant, two Papal, and one Greek. Of the four Protestant institutions, two are under American auspices, one English, and one Prussian. Of the American schools, one is a girls' seminary, a boarding-school of a high order, with fifty boarders, who paid during the past year more than a thousand dollars for their board and tuition. Though the teachers are all natives, no American need feel ashamed of this most flourishing school, whether it be in respect to the beautiful edifice which is its home, or its admirable internal discipline. The other is the Syrian Protestant College, with whose name many of your readers are familiar, and to whose endowment not a few of them have contributed."

Students are flocking to this college from all parts of the East, and even from Africa. Professor Blyden, of Liberia College, is now in attendance, studying Arabic.

CURRENT PUBLICATIONS.

MR. MONTEITH'S "Physical Geography"[1] has been before the public for several months, and has acquired no inconsiderable notoriety. It may not be amiss to review briefly some of its claims to public favor.

In describing its character, the author says that, avoiding the use of all technical terms that would perplex the young learner, he has endeavored to explain the leading principles of Geography by means of familiar language and comparisons, and suggestive illustrations, according to the Object system of instruction.

To exemplify his meaning, he refers to two illustrations—one on page 18, the other on page 27. The first, he says, "explains the theory of Volcanic Action." This implies that there is but one theory of volcanic action. Perhaps the author has never heard of any other; or it may be that there is one, which, in his estimation, is preëminently correct; it is *the* theory. To learn what this theory may be, and how it is explained, we turn to page 18 and find—not a word about volcanic action. A typographical error, doubtless; for, looking further, we discover on the next page a picture of a young lady standing by a table and pointing at something described below as "A Cake which is burst open at the Top by the escape of Steam, arising from the Fluids within the Cake, the Heat of the Oven corresponding with that of

(1) MONTEITH'S PHYSICAL AND INTERMEDIATE GEOGRAPHY. Part I. Geography Taught as a Science. By JAMES MONTEITH. New York: A. S. Barnes & Co.

the Earth's Interior," while a boy and two small girls are looking on, apparently with great interest. All this, we are told, may illustrate a "Volcano, and Fissures caused by Earthquakes." Possibly it may, but it is not very clear; nor do we learn from it much about "the theory of Volcanic Action." That, however, may be owing to our inability to comprehend the correspondence of the "Heat of the Oven *with* that of the Earth's interior."

Perhaps the illustration on page 27 may be more fortunate. Turning to it, we see a youngster standing by a stove, with one hand resting on the cover of a teakettle, and the other gracefully extended to a group of children, to whom he appears to be teaching "Geography as a Science." The text informs us that the "Geysers or Hot Springs of Iceland may be illustrated by a kettle partly filled with water and placed on a hot stove." Then follows an elaborate account of a theory of Geyser action which was exploded years ago. If Mr. Monteith will take the trouble to read up a little on Modern Science, he will learn to regard less highly his "model illustration," and be persuaded, perhaps, to put his stove and kettle to some more appropriate use.

We believe in pictures. They are especially useful in a primary geography. But it is quite important that they give at least a tolerably correct idea of what they are said to represent. This does not seem to have ever occurred to Mr. Monteith. Of the sixty cuts that occupy so large a portion of the forty pages of Physical Geography, some are good; very many are indifferent, and are used, evidently, to fill up; while not a few, like the tea-kettle illustration, simply teach falsehood. We have room to refer but to one other, a wonderful picture in its way. It will be sure to delight the children. In fact, it is so juvenile in conception that we suspect our author must have "borrowed" the idea, if not the design, from some little boy's slate. We have seen many such pictures drawn by artists of tender years. It is on page 23, and represents, we are told, "A Sectional View from the Atlantic Coast of the United States, Northeastward to Norway." We never heard of a sectional view *from* a place before; but that may be accounted for by the fact that geography has never before been taught *as a science*. We would advise our readers to examine this picture; they will see many marvelous things in it, not the least noticeable of which are whales five hundred miles long and sea-weeds twice as long as the whales, and other sea-monsters equally wonderful. But pictures are not the only notable feature of "Geography taught as a science." The familiar comparisons mentioned in the preface, are quite as remarkable and as worthy of commendation.

The first paragraph of the Geography affords a characteristic example. In it, the "process by which the world was made from chaos" (mark the word) is compared to the "Growth of a Plant!" One would think a single such comparison would be sufficient, even for the youngest learner. But not so. Paragraph II. endeavors to make the matter still clearer: thus—"The earth's formation from chaos may be illustrated by an egg, whose fluid substances, by a certain application of heat, and in a certain time, are changed into a beautiful living bird." Chaos is a fine point to start from. Its likeness to an egg is so apparent, and the analogy between creation and the process of incubation so complete, that the beauty and force of the figure will be recognized at once. Yet we fear that some inquisitive child may ask what *chaos* means, and how the world is like a beautiful bird—but what absurd questions will children not ask?

It would require an entire number of the MONTHLY to notice all the "familiar comparisons." A few examples must suffice.

Par. 13, p. 9, says: "All the fresh water of the land *is raised* (!) from the great reservoir, the ocean, by the combined agencies of the sun and air, *acting like a great pump and sprinkler*." For a matter of fact statement, this is a little mixed. It is not clear which is the pump, and which the sprinkler, or how a sprinkler can raise any thing. Besides, we fear that the little boys and girls who live in the country and are unacquainted with city waterworks, may fail to appreciate the force of the comparison. Perhaps, however, the more poetical version of the great fact, as given in par. 16, was intended for them. It reads thus: "The sun, by his Powerful Light and Heat, so acts upon the sea, that thin fresh water, called vapor, is separated from it. The vapor, *like a feather loosened from a bird*, is borne upward by the atmosphere

and carried away by the wind!" Who will say that there is no poetry in science? or that the mysteries of nature cannot, without sacrifice of precision, be brought within the comprehension of children?

The following double-barrelled comparison is not brilliant or poetical; but it is marvellously clear, and contains a world of truth. It is found in par. 2, p. 42: "Soil that is destitute of Decomposed Animal and Vegetable substances is very poor; *such* was the condition of vegetable life at its commencement, and *so also* was the beginning of animal life—very inferior in character and form." This paragraph affords, also, a fair example of the learned style that our author largely indulges in. But he does not restrict himself to one style. He employs besides the *argumentative* style, the *inflated* style, the *figurative* and the pious style. Our space permits but a brief citation from each.

A fine specimen of the argumentative style is found in the "Introductory." This page is intended to prove that the world was made for a great purpose, according to a preconceived design, and also to show what that purpose was. It leads off in this manner: "The robin builds her nest in the tree for the *Purpose* of there depositing her eggs, and of bringing forth and protecting her young. For the *Purpose* of protection and comfort, men build houses, found cities and establish governments. *Purpose, therefore, leads to design and action.*" Without pausing to notice the awkwardness of the first sentence or the improper use of *purpose* in the second, let us observe the bearing of the whole upon the main argument. The robin builds for a purpose. *Whose* purpose—her own? Certainly not, for it is a characteristic of instinct (and nest-building is instinctive), that it impels to action without the existence of a conscious design on the part of the actor. Is it God's purpose? Then, what possible analogy can there be between the robin's action, which is determined by another, and the self-determining action of Divinity? The entire page is a model of illogical reasoning, as in fact are the many other examples of this style throughout the book.

Therefore is a favorite word with Mr. Monteith. Like a scoolboy in his first essays at writing, he lugs it in on all possible occasions. Inferences the most far-fetched and often ridiculous are introduced by *hence* or *therefore*.

Are children so stupid that they must be reasoned (!) with in this wise?—"A bird was not formed to live in the water like a fish, hence it is not covered with scales: a fish cannot live in the air and find its food among the trees; therefore, it is not provided with feathers." (Par. 35, p. 44.)

The inflated style is more entertaining. It is characterized by "words of learned length and thundering sound," and is used chiefly in stating facts or theories that would be too commonplace if briefly expressed. For instance the simple statement, *water runs down hill*, would hardly be worthy of a place in "Geography Taught as a Science;" but when properly inflated it is worthy even of bold-face type; thus, (par. 13, p. 28): "The **Sources of Rivers always occupy Higher Ground** than do their mouths." This appears to be our author's natural style. It is very impressive at times. Thus: "The approach of an earthquake like the eruption of a volcano, is often heralded by symptoms of unusual agitation beneath the surface." (Par. 15, p. 19.) Again:

"The Esquimaux derives his support from the seal, and exerts his greatest energies in the capture of this aquatic mammal!" (Par. 29, p. 44.) Such indifference to good grammar is positively sublime. Mr. Monteith appears not to know that *Esquimaux* is *plural*. In still another place (par. 18, p. 45) he uses the word incorrectly: "The *Esquimaux* and the Laplander cling with strong attachment to their boundless fields of snow," etc. In this connection we would suggest to Mr. Monteith that "the Caucasians" do not "comprise the most powerful and enlightened nations of the world" (par. 34, p. 46), though the *Caucasian race* does.

Several examples of the figurative style have already been given. Many more might be quoted, did our space permit. The following (par. 5, p. 10) is instructive; it is Geography *taught as a science:* "A continent with its peninsulas, highlands, lowlands, lakes, and rivers, is like a great tree that has grown from a small shrub." Very like, indeed! but who besides Mr. Monteith would have suspected it?

The following (par. 34, p. 29) is sentimental, and recalls tender recollections of bygone years: "In many instances, springs,

but a few rods distant from each other, and fed from snows resting on the same peak, supply rivers which terminate at different sides of a continent; just as schoolmates become separated from each other, and are led by inclination or circumstances to spheres of usefulness in different parts of the world."

Such affecting allusions naturally lead to the *pious style*. The characteristic of this style is the frequent employment of the words *Creator*, *Providence*, and other appellations of the Deity. It presumes on the part of the writer, an intimate acquaintance with God's thoughts, motives, and intentions—past, present, and to come. Par. 28, p. 15, is a good example of this style: "For the same reason that you put a piece of ice into a pitcher of water in summer rather than in winter, Providence has lifted the highest mountains in the tropical, and not in the polar regions of the earth."

We put ice into our water in summer-time because we desire cold water to drink; ergo—but we forbear.

Again (par. 57, p. 42): "The distribution of coal in various parts of the earth plainly indicates that its importance to man was anticipated by the Creator? [The interrogation point is not ours.] Even the necessity of coal in the working of iron was provided for by Him; this is observed in the remarkable association of the two!" For every iron mine in the neighborhood of coal, there are scores where there is no coal; besides, even when the two are together, it rarely occurs that the coal is of such a nature that it may be used in the smelting of the ore. A "remarkable association" truly!

One more example of this style must suffice, though there are many that are worthy of notice. Par. 76, p. 18, says: "The advantages of national communication are now seen by man, but they were recognized by the Creator when he formed the mountains with their intervening passes." This fairly rivals the discovery of the worthy parson who first remarked the marvellous kindness of Providence in always causing rivers to flow by large towns.

But we have neglected to mention the application of the "Object System," which, we are told, constitutes a special excellence in "Geography taught as a Science." To the uninitiated it might seem that in teaching geography the Object Method could be employed only by taking the pupils out into the open air and pointing out to them such representatives of natural divisions as might be found in their immediate neighborhood; or by excursions to adjacent horse-ponds, where might be reproduced on a small scale, seas, gulfs, bays, islands, peninsulas, and the like. But not so. The Object Method in Geography does not presuppose or require the presence of visible objects. It consists simply in the use of the word *observe* and its derivatives; and the more distant and inaccessible the objects to be *observed*, the better. Thus: "When considering the position and height of a chain of mountains, the course of the winds, or of an ocean current, he (the pupil) *should observe* the influence exerted by each upon the climate, vegetation, and the pursuits of man in the different regions." (Par. 23, p. 7.) Again (par. 25, p. 7): "He *should observe* that the highest mountains are in the hot regions of the earth, where their lofty peaks, continually wrapped in snow, are faithful refrigerators, reducing the temperature of the air on the heated plains below." How easy!

Though loth to leave so entertaining a subject, we will close with a citation which ought to be written in letters of gold, and suspended in every school-room as a perpetual warning to lazy boys and girls.

"Imagine the Tropical and Frigid Regions to be in a State of Rest, refusing to exchange their waters; one would be intolerable from excessive heat, the other from excessive cold; the result would be ruin to both. *So also would it be with man in the state of idleness!*" (Par. 44, p. 26.)

Surely, if the fear of such disastrous climatic changes will not make them industrious, nothing else will. So much good, at least, may be derived from Geography *taught as a science*.

In 1857, Miss Della Bacon disputed the title of Shakespeare to the works which bear his name, and claimed that several of them were written by Francis Bacon. After the publication of her work a society was formed in England for the purpose of investigating the matter; but, finding the difficulty of solving the problem greater than had been supposed, it fell in pieces,

(2) The Authorship of Shakespeare. By Nathaniel Holmes. New York: Hurd & Houghton. 12mo, pp. 601. $2 25.

and the question was forgotten. Judge Holmes,[3] of Missouri, has reopened the discussion with great force and precision. He goes further than Miss Bacon, and asserts that Lord Verulam wrote all the works attributed to Shakespeare, and his treatment of the subject evinces remarkable familiarity with the writings of both Bacon and Shakespeare. He briefly recounts the principal incidents in the life of the latter, and fully discusses his lack of education, his distaste for literature, his indifference concerning his reputed works, and the strange circumstance that no original manuscripts of the dramas have ever been seen. He shows that Bacon was a poet, and that, even in his own time, he was suspected of writing plays, but that he never confessed his authorship, as dramatic writing was at that time discreditable among the higher classes. The plays certainly prove their author to have been a scholar such as Shakespeare could hardly have been, and Judge Holmes' comparison of them with Bacon's works discloses a striking similarity, we had almost said identity, of style and expression. In many cases whole paragraphs are the same. The volume concludes with an analysis of Bacon's philosophy, which, as the author shows, thoroughly coincides with that advanced in the dramas. The arguments of Judge Holmes are plausible and ingenious. They lead us to doubt Shakespeare's title; but we cannot admit that Bacon's claim is clearly established, nor do we think it can be, at this late day.

The contributions of Sir John Herschell to "Good Words" and other magazines, together with several of his lectures, have been reprinted under the title of "Familiar Lectures."[3] Some of the papers are popular, and rival Tyndall's lectures in clearness and attractiveness. The topics are earthquakes, the sun, comets, the weather, celestial weighing and measuring, light, sensorial vision, systems of measurement, atoms, origin of force, absorption of light, and target-shooting. The lectures on light form a popular treatise, as exhaustive as is consistent, and occupy nearly two hundred pages. In the tenth lecture, the author gives an entertaining history of weights and measures. He deprecates a national adoption of the metrical system. He prefers the British system, which he maintains is more accurate and convenient. He earnestly opposes any change of English nomenclature in case the French standard be adopted. The lecture upon Sensorial Vision is interesting, but does little toward clearing up this perplexing subject. This collection is the most important of its class published during the year.

Mr. Magill's "French Grammar"[4] differs but little from its predecessors. It omits exercises in translation from French intc English, and contains a Fench, English, and Latin vocabulary which is fully worth the price of the book. The language is concise almost to harshness. This grammar is fitted for the use of maturer students only. Its compactness will prove to be a serious obstacle to its introduction.

A new edition of Prof. Elderhorst's "Manual"[5] has just been published. Besides the matter of previous editions, this contains a new chapter from Von Kobell, on determinative mineralogy, and a chapter, from Laurent, on the discrimination of inorganic compounds. The fourth chapter has received some important additions, and several new tables have been appended. This work has long been a favorite manual, and, as thus enlarged, is certainly without an equal.

Messrs. Lippincott & Co. have published a convenient manual upon the Metric System.[6] It contains an explanation of the system translated from the authorized French text-book, together with the recent acts of our Congress concerning the matter. As the metric system will soon become the legal standard of weights and measures in this country, this compilation might be advantageously introduced into our schools.

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(3) Familiar Lectures on Scientific Subjects. By Sir John Herschell, Bart., K.H., etc. London and New York: Alex. Strahan. 12mo, pp. 307. $2 50.

(4) A French Grammar, etc. To which is Added a French, English, and Latin Vocabulary. By Edward H. Magill, A.M. Boston: Crosby & Ainsworth. 12mo, pp. 287.

(5) A Manual of Blowpipe Analysis and Determinative Mineralogy. By William Elderhorst, M.D. Philadelphia: T. Ellwood Zell. 12mo, pp. 179. $2 50.

(6) The Metric System. Philadelphia: J. Lippincott & Co. 16mo, pp. 37.

In his "Christian Ethics"[7] Dr. Alden designed to give a directory of duty. He has succeeded. The work is eminently practical. The Bible is his supreme authority: "To the law and to the testimony" he fearlessly appeals. His definitions are clear, and his statements of duty pointed. On the duties of the family circle he is too brief; these, especially in this generation, should occupy a prominent place in every treatise on morals. On civil government he is in advance of his contemporaries. "It is the duty of all citizens to render prompt and willing obedience to the laws of the land." "There are limitations to our obedience." "When the law is in conflict with the law of God, it is not our duty to obey. 'We ought to obey God rather than men.' God's law is always right. It is our duty always to do right. Hence we are not to do what is contrary to the will of God." Concerning the duties of legislators he shows more common sense than most writers. "He that ruleth over men must be just, fearing the Lord." Throughout the whole treatise sound judgment and a thorough knowledge of the subjects are manifest. The style is vigorous and exact.

The Christian theory of education regards both sexes as equal, made alike to the image of God, and requiring the same kind of instruction. The practical belief of men is that a radical difference exists between the sexes, and that each has its peculiar station in life. The ordinary theory of education asserts the existence of a double moral code, with masculine and feminine virtues, and a separate law of duty and honor for either sex. It fits the man for the world, the woman for the house. From early youth boys are trained to proficiency in some special calling, but the education of girls is general and without object. After spending their younger years in a hap-hazard manner at home, or at an inferior school, they are sent to a high-school or college, for a year or two, to finish their education—to finish what has never been begun—and when at an age when boys have only begun their course of study, they are withdrawn from school: their education is complete. No training for life has been given, no knowledge of future responsibility imparted, and, when "finished," they are almost as ignorant as at first. From this time until marriage, they are without employment, and fritter away their time in amusements, or in fruitless, because desultory, reading.

Thus among the higher classes the best part of woman's life is wasted. What can be done? To give a practicable answer is the purpose of Mrs. Davies'[8] essay. After discussing "things as they are," she talks of "things as they might be," and demands that training for special callings be substituted for the present profitless process. She pleads for the admission of women to the medical profession, and maintains their fitness to act as chaplains in workhouses, as bookkeepers, as overseers in factories, and even as superintendents of agricultural operations. With great force she supports her demand for educational privileges equal to those of men, and refutes many objections to her propositions. She exposes the contradictory nature of the present method of education, and in her "Specific Suggestions" proves herself practically conversant with her subject.

In many respects this essay resembles Miss Sewell's "Principles of Education." It takes much the same ground, and adopts a similar method of argument. Some sections refer exclusively to British society, but the greater part is of general application. It is unmarked by brilliance of thought or expression, but is full of good sense.

As a mere narration, "Dr. Johns"[9] is readable, for it is well told; but as a novel, it is poor. The story appears to have been begun and finished without any particular object in view, and the author seems to have changed his mind about the *denouement* several times. It certainly will not increase its author's reputation.

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(7) Christian Ethics, or the Science of Duty. By Joseph Alden, D.D., LL.D. New York: Ivison, Phinney, Blakeman & Co. 12mo, pp. 170.

(8) The Higher Education of Women. By Emilie Davies. London and New York: Alex. Strahan. 16mo, pp. 191.

(9) Dr. Johns. A Narrative of Certain Events in the Life of an Orthodox Clergyman in Connecticut. By the Author of "My Farm of Edgewood." New York: Scribner & Co. 12mo, two vols., pp. 300-296.